CLAIMS

1. A process for producing polyarylene sulfide, comprising: reacting an aromatic dihalide compound and an alkaline metal compound in a polar organic solvent for polymerization under heating, and cooling a system including the reaction mixture to recover particulate polyarylene sulfide, wherein the system after the reaction is gradually cooled at an average cooling speed of 0.2 to 1.0 ℃/min. selectively in a temperature range of maximum system-viscosity temperature ±1 ℃.

2. A process according to Claim 1, wherein in the reaction under heating, a phase separation agent is added to a reaction system at a desired time from a start to an end of the reaction so as to form a liquid-liquid phase separation state including a thick phase and a dilute phase of product polymer, and then the cooling is started.

3. A process according to Claim 2, wherein the phase separation agent is water.

4. A process according to Claim 3, wherein the alkaline metal compound is an alkaline metal sulfide and the phase separation agent is water;

the reaction under heating includes a preceding

step of reaction at a temperature in a range of 180 ℃ to 235 ℃ in the presence of 0.5 to 2.4 mols of water per mol of the charged alkaline metal sulfide to form a prepolymer at a conversion of 50 to 98 mol% of the aromatic dihalide compound, and a subsequent step of adding water so as to provide an amount of water exceeding 2.5 mols and at most 7.0 mols per mol of the charged alkaline metal sulfide in the reaction system and heating the system to a temperature of 245 to 290 ℃ to continue the reaction; and

after the reaction, the cooling is started.

5. A process according to any preceding claim, wherein the reaction and the cooling are performed in a reaction vessel equipped at its top with a reflux condenser as a principal cooling means for the cooling.

6. A process according to Claim 5, wherein during the cooling, at least a portion of non-condensable gaseous component is removed from a top gaseous phase in the reflux condenser to enhance a cooling capacity of the reflux condenser.

7. A process according to any preceding claim, wherein the system is cooled at a cooling speed exceeding 1.0 ℃/min. outside a temperature range of maximum system-viscosity temperature ±3 ℃.

8. A process according to Claim 7, wherein the system is cooled at a cooling speed of at least 2.0 ℃/min. outside the temperature range of maximum system-viscosity temperature ±3 ℃.

9. A process according to any of claims 1 to 6, wherein the system is cooled at a cooling speed exceeding 1.0 ℃/min. outside a temperature range of maximum system-viscosity temperature ±2 ℃.

10. A process according to Claim 9, wherein the system is cooled at a cooling speed of at least 2.0 ℃/min. outside the temperature range of maximum system-viscosity temperature ±2 ℃.

11. A process according to any preceding claim, wherein the system is cooled at an average cooling speed of 0.2 to 1.0 ℃ in the temperature range of maximum system-viscosity temperature ±2 ℃.